

# Peripheral artery occlusive disease a major contributor to cardiovascular public health burden

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Online publish-ahead-of-print 3 February 2015

**This editorial refers to ‘Peripheral arterial disease and critical limb ischaemia: still poor outcomes and lack of guideline adherence’<sup>†</sup>, by H. Reinecke et al., on page 932.**

Peripheral artery disease of the lower extremities (PAD) has become increasingly recognized as a major contributor to the cardiovascular public health burden. It identifies a cohort of patients at increased risk of major cardiovascular ischaemic events. Moreover, its prevalence steadily increases as the population ages, becomes more obese, and as diabetes becomes more common. The German epidemiological trial on ankle brachial index (GetABI) and the Registry REducation in Atherothrombosis for Continued Health Registry (REACH) have highlighted that even asymptomatic subjects with PAD have a prognosis almost as poor as that of patients with symptomatic disease, and demonstrated a greater degree of undertreatment of atherosclerosis risk factors relative to those with coronary artery disease or cerebrovascular disease.<sup>1,2</sup> Follow-up data from REACH and findings from other PAD registries have revealed higher cardiovascular event rates for patients with PAD compared with patients with coronary artery disease or cerebrovascular disease, and more effective risk factor control has been shown to be associated with a lower rate of cardiovascular events.<sup>3–5</sup> The most important recent initiatives to improve management of PAD have been the American College of Cardiology/American Heart Association (ACC/AHA) Practice Guidelines for the management of patients with PAD, the Trans-Atlantic Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC), and the European Society of Cardiology (ESC) Guidelines on the diagnosis and treatment of PAD, which define educational, clinical, and research goals for the near future.<sup>6–8</sup>

Related to these initiatives, Reinecke et al. now report a contemporary data set on 41 882 inpatients treated for PAD in Germany between 2009 and 2011. The authors illustrate that despite well-positioned guidelines, outcome of patients with PAD is unchanged and is particularly poor in those with critical limb ischaemia irrespective of guidelines that highlight effective approaches to the care of patients with limb-threatening PAD.<sup>9</sup> The interdisciplinary

‘ACC/AHA Guidelines’ published in 2005 defined care algorithms for acute and chronic critical limb ischaemia. The second international TransAtlantic Inter-Society Consensus (TASC II) for the Management of Peripheral Artery Disease published in 2007 emphasized early referral to vascular specialists/vascular centres to plan revascularization.<sup>6,7</sup> Revascularization is the recommended primary treatment option, since critical limb ischaemia is associated with potential limb loss and raised mortality if left untreated. Revascularization should be attempted without delay in all patients presenting with critical limb ischaemia, whenever technically possible and if clinical status is not hopelessly non-ambulatory.<sup>10</sup> It goes without saying that imaging is a cornerstone and no patient should undergo amputation without angiography.

Interestingly, Reinecke et al. show continuously rising numbers of revascularizations, but more so in patients with intermittent claudication (Rutherford 1–3). Among the 4298 amputated patients with critical limb ischaemia (Rutherford 4–6), 37% had not received any angiography or revascularization, although guidelines provide good evidence that amputation-free survival can be improved with consequent vascular diagnostics and revascularization regardless of whether this is endovascular or surgical. In particular, in recent years, endovascular treatment has become more and more prominent, due to development of new technology and an increase in endovascular skill. The low morbidity and mortality of these procedures compared with surgical revascularization, particularly in patients with severe co-morbidity, has expanded the spectrum further. In contrast, guidelines from various societies state quite clearly that patients with intermittent claudication should undergo lifestyle modification and supervised exercise training first as there is a considerable rate of recurrences and no proof that the incidence of critical limb ischaemia will change with early revascularization,<sup>11</sup> suggesting that restricted competence in non-specialized centres or DRG-driven incentives might have impacted treatment decisions in Germany.

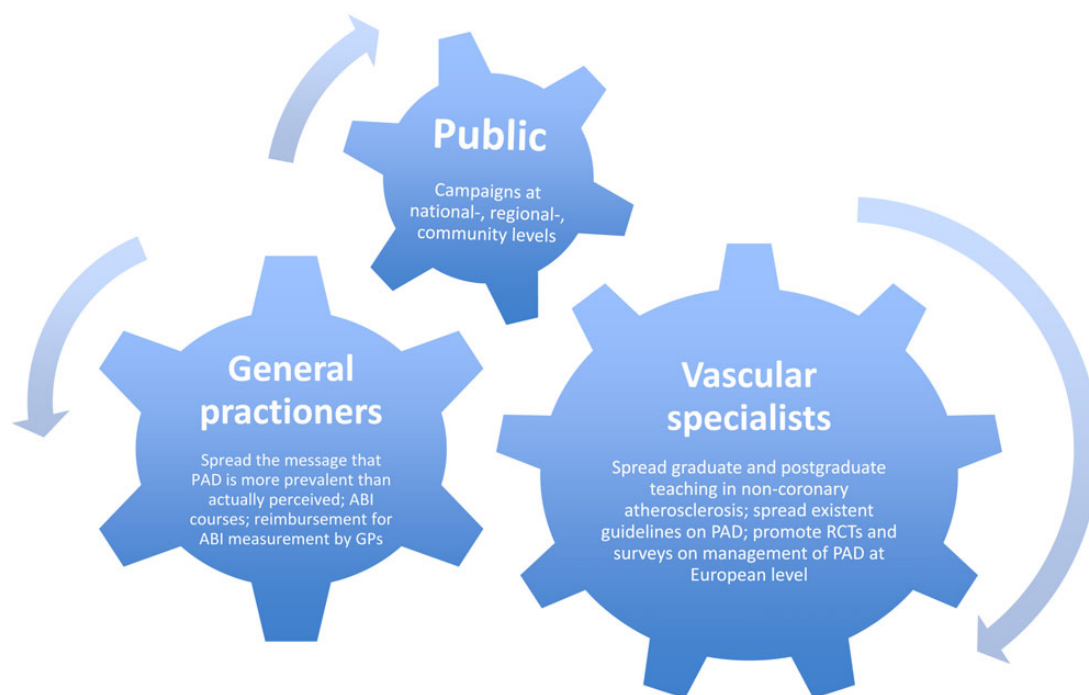
The authors also demonstrate a continuous increase in PAD burden of 21% from 401 000 cases in 2005 to 484 000 cases in 2009, and an increase of the proportion of critical limb ischaemia

The opinions expressed in this article are not necessarily those of the Editors of the *European Heart Journal* or of the European Society of Cardiology.

<sup>†</sup> doi:10.1093/eurheartj/ehv006.

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**Figure 1** Measures to increase recognition and awareness for peripheral artery disease. Adapted according to: Gallino A, Aboyans V, Diehm C, Cosentino F, Stricker H, Falk E, Schouten O, Lekakis J, Amann-Vesti B, Siclari F, Poredos P, Novo S, Brodmann M, Schulte KL, Vlachopoulos C, De Caterina R, Libby P, Baumgartner I; European Society of Cardiology Working Group on Peripheral Circulation. *Eur Heart J* 2014;35:1112–119.

from 40.6% to 43.5%, creating considerable healthcare costs. Although less than half of the patients suffered from critical limb ischaemia, they were responsible for 65% of the €141 million in-hospital costs. A previous report from REACH estimated and compared vascular-related hospitalization costs in patients enrolled in the USA with symptomatic coronary artery disease, cerebrovascular disease, and PAD, and found costs to be higher for patients with symptomatic PAD, largely because of the high rate of peripheral revascularization procedures. Overall, approximately half of the hospitalization costs in patients with symptomatic PAD were due to PAD-specific treatment, whereas the other half were for the treatment of coronary artery or cerebrovascular disease-related atherothrombotic events or other cardiovascular reasons.<sup>12</sup>

Given the impact of PAD, a division in vascular medicine has been officially recognized by the UE regulatory agency in Europe (Union Européenne des Médecins Spécialistes, UEMS; <http://www.uems.net/EU-Division> of Angiology), and a National Institute of Health (NIH) fellowship programme in clinical vascular medicine has been advocated in the USA (NHLBI Vascular Medicine Training Program Working Group; <http://www.nhlbi.nih.gov/Meetings/workshops/vascular-med.htm>). This fellowship includes a 2- to 3-year training period with intensive teaching in basic, clinical, pathophysiology, non-invasive, and invasive diagnostic, prevention, and therapeutic strategies in vascular medicine.<sup>13</sup>

Peripheral artery disease is a critical cause of cardiovascular morbidity and mortality, and is the primary cause of amputation, and yet is often not promptly recognized or treated. Although the outcome of

patients with critical limb ischaemia is described to be considerably improved, with the majority of patients being suitable for revascularization and as major amputation has become an infrequent outcome event if treated in vascular centres with adequate expertise, this still seems not to be true outside of specialized centres.<sup>14</sup> Last, but not least, data demonstrate the very high cost of PAD and there still are insufficient data available that clarifies whether more effective use of preventive interventions, i.e. more consistent use of risk reduction medications, access to supervised exercise programmes, and smoking cessation strategies in this population, would reduce disease progression and costs associated with downstream vascular resource use. There is no doubt that major efforts need to be made in order to heighten awareness of the problem among the medical community and the general population (Figure 1).

**Conflict of interest:** none declared.

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